Representative IPR Practices for Technologies Developed with Public Funds

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Meaning of Technology Transfer

- Broad set of processes, covering flow of knowledge, experience, equipment amongst stakeholders
- Includes both hardware and software
- Includes technology diffusion and technology co-operation
- Between developed and developing countries as well as within/amongst each of the groups
- Includes learning to understand, choose, utilise, adapt and replicate technology

Importance of Technology Transfer in Climate Change

- Achieving ultimate objective of UNFCCC (stabilisation of concentrations at “safe level”) requires rapid technological innovation and widespread transfer of environmentally sound mitigation technologies
- Adaptation to climate change is inevitable and that also requires the transfer of technologies for adaptation
- Fits into the local needs and priorities to find new sustainable paths for development

What are the main barriers for technology transfer?

- Lack of data, information, knowledge, awareness
- High transaction costs
- Inadequate access to capital
- Risk aversion in financial institutions, incl. MDB's
- Trade barriers such as tariffs
- Insufficient human and institutional capabilities
- Poor understanding of local needs
- Lack of adequate codes and standards for EST's
- Low, subsidised conventional energy prices
- Absence of full-cost pricing
- Are intellectual property rights (IPR) a barrier or an aid to technology transfer?

IPRs from government-sponsored research belong to participants

- Governments support variety of research activities
- Activities take place in government-owned facilities, private companies, and/or in universities
- Research outcome can be a patentable technology or process and copyrightable software or publications that are worthy of IPR protection
- High degree of commonality across countries
  - IPRs are assigned to one or more participants in the research process
- Management of IPRs has evolved from an Open Science Model to a Licensing Model

Ownership of Intellectual Property: Examples

	Universities			Non-university Public Research Organizations		
	Institutions	**Inventor**	**Govt.**	**Institutions**	**Inventor**	**Govt.**
Canada	X	X		X		
Republic of Korea	X			X		
United States	X	°	°	X	°	°

Notes: X: -- Legal basis or most common practice.

°: -- Allowed by law/rule but less common

Source: OECD (2003).

Number of licenses and license income, 2001 (Examples: US, Canada and the UK)			
Indicator	**US**	**Canada**	**UK**
PROs responding to the survey	141	19	72
Number of licenses yielding income	7,562	453	483
Amount of research expenditure per income yielding license	3.6 M Euros	2.9 M Euros	4.3 M Euros
Amount of license income earned for each Euro spent on research expenditure	4%	2%	1%

Source: UNICO-NUBS (2001) as reported in EC (2004)

Patents and Licensing Activities, United States (2000)

	Patents		Licenses		
	Applications	**Grants**	**Earning Income**	**Income per license (US$)**	**Gross Income (US$ Mn.)**
All	**8,294**	**5,103**	**9,154***	**149,334***	**1,367.1***
Universities	**6,135**	**3,617**	**8,670**	**149,648**	**1,297.4**
PRO	**2,159**	**1,486**	**484**	**143,801**	**69.6**

* -- Estimated by the authors by adding the PRO and Universities' rows, since data were collected as running royalties, and licenses can earn income in other ways also..

Source: OECD (2003)

A US Example of IPRs and Technology Transfer: Lawrence Berkeley National Laboratory

- LBNL is a national energy research laboratory that is managed by the University of California for the US Department of Energy (DOE)
  - — Example of a government owned contractor operated entity (GOCO)
- Industry can access technologies developed through research funded by the US government
  - — Seek licenses to the technologies
  - — DOE and industry jointly sponsor research and industry conducts research with laboratory scientists in a public private partnership
- Four ways to protect IPRs from LBNL research
  - — Patents, copyrights, trade marks, and trade secrets

Patents and Copyrights

- LBNL's Technology Transfer Department (TTD) determines the whether or not to seek patent protection for the invention
  - Costs between $10,000 to $20,000 to obtain a patent
- LBNL/TTD will market technology worldwide
  - Looks for companies that are able to marshal the financial, manufacturing marketing, and managerial requisites to commercialize the technology
  - LBNL does not discriminate between US and non-US entities in its selection of companies
  - Maybe licensed for use on a exclusive basis (company or region) or non-exclusive basis
- The US government is granted a fully paid-up, nontransferable, non-exclusive license to use the invention for government purposes only
- Revenue earned by LBNL is shared to cover the cost of patenting, and in part with the inventor. Remaining amount is used to support R&D.
- Software maybe copyrighted and licensed to developers, distributors, or users

Collaborative Research

- Collaborative research between LBNL and other scientists is a common practice
- Many MOUs and Cooperative Research and Development Agreements (CRADAs) exist with US and foreign entities
  - — Include extended visits, collaborative research, joint publications, and shared inventions
- Collaborative research may be better than granting licenses and access to technology since it promotes capacity building

Canada, Republic of Korea and the United Kingdom

- Basic paradigm of government-sponsored research is same as that in the US
- Public funds are used to facilitate creativity and synergy among public and private sectors, while ensuring that property rights to outcomes rest in one or more domestic entities
- Outcomes may be applied worldwide along a pathway of licensing or royalty payments rather than use without restriction in the public domain

Patents and Licensing Activities, Republic of Korea (2001)

	Patents		Licenses		
	Applications	**Grants**	**Earning Income**	**Income per license (US$)**	**Gross Income (US$ Mn.)**
All	1,692	1,018	132	28,955	3,822
Universities	244	186	22	46,909	1.032
PRO	1,448	832	110	25,364	2,790

Source: OECD (2003)

Conclusion

- Since the drafting of the Climate Convention in 1992, the IPR regime has evolved significantly
- Governments allocate IPRs to research organizations to a varying degree
- Since 1980, government in many countries have taken the initiative to transfer IPRs to recipient research institutions
  - Current technology development and diffusion is along a pathway of licensing and royalty payments rather than use without restriction in the public domain
  - Compensation to inventors and research institutions provides a viable and sustainable means for continued future innovation
- Joint research between institutions of higher learning offers an alternative way to provide technology transfer and capacity building in partnering countries